



**U.S.NRC**

UNITED STATES NUCLEAR REGULATORY COMMISSION

*Protecting People and the Environment*

# **New Reactor Construction**

**Safety Culture Considerations**

**April 3, 2008**



# Presentation Topics

- Lessons Learned
- Commissioners' Current Views
- Reactor Oversight Process
- Construction Inspection Program (CIP)
- Contractor Review
- NRO Safety Culture Task Group
- Next Steps
- Input/Feedback/Questions



## Lessons Learned from the Past

- Captured in NUREG 1055 “Improving Quality and the Assurance of Quality in the Design and Construction of Nuclear Power Plants”
- At the request of Congress, NRC conducted a study of existing and alternative programs for improving quality and the assurance of quality in the design and construction of commercial nuclear power plants.



# NUREG 1055

- “The NRC inspection program was slow to synthesize scattered quality-related inspection findings coming in over a period of time into a comprehensive picture of a project-wide breakdown.”
- “The threshold for reacting to construction-related problems was set higher than for operational problems.”



## Flawed Beliefs - Construction Inspection

- No immediate threat to public health and safety posed by construction deficiencies (failed to consider future impacts)
- Construction problems would be found during start up testing
- Project-wide pervasive breakdown to be demonstrated before strong enforcement action would be taken for construction quality problems



# Commissioners Recent Views

- “Any organization that does not have current nuclear experience and is interested in building nuclear plants must accept the need to constantly foster a strong safety culture in its nuclear organization. This is non-negotiable.” (Lyons – “The Value of Regulation in the Quest for Safe and Secure Nuclear Energy,” Cambridge Energy Research Associates -February 15, 2008)
- “If we want to continue to improve on safety, we must look beyond just engineered controls. It is possible that bad decisions or a lack of a sufficient focus on safety, not technological failures, will ultimately cause problems in the future. Perhaps the greatest additional safety benefits are to be found in a renewed and deeper focus on the safety culture of NRC licensees.” (Jaczko – “Being a Decisive Regulator, RIC, March 11, 2008)



# SRM COMGBJ-08-001

## A Commission Policy Statement on Safety Culture

- The Commission has approved the need to expand the Commission's policy of safety culture to address the unique aspects of security and to ensure the resulting policy is applicable to all licensees and certificate holders.



## **No Recent U.S. Reactor Construction Experience**

- How do we provide NRC oversight during construction to prevent the same problems from the first round of construction?
- What can we learn from operating nuclear reactors to apply to new construction?
- What can we learn from new reactor construction experience internationally?





# ROP – Reactor Oversight Process

- Developed to be more transparent, understandable, objective, predictable, risk informed and performance-based than prior assessment process
- Integrated cross-cutting areas
- Focused additional NRC resources where required



# Recent ROP Safety Culture Enhancements

- Introduced safety culture enhancements in the ROP in response to Davis-Besse Reactor Pressure Vessel Head event; Commission direction; and encouragement from other stakeholders (e.g., Congress, GAO)
- Identified safety culture components based on information from nuclear industry, international organizations and regulatory bodies, other domestic industries, staff expertise, and with involvement of stakeholders
- ROP safety culture enhancements have been developed and implemented in baseline and supplemental inspection programs and assessment process



# Construction Inspection Program (CIP) and Safety Culture

- Developed an interoffice team to review ROP safety culture enhancements for applicability to new reactor construction environment
- Contracted for independent evaluation of safety culture components to new reactor construction environment
  - Reviewed previous domestic and international construction experience



# Contractor Assessment Results

- All the Safety Culture Components apply to the new reactor construction environment
- Key issues that should get greater and earlier focus in the inspection oversight program based on lessons learned from construction experience:
  - Training of construction & manufacturing workforce to understand the requirements & expectations of their jobs in the nuclear environment
  - Corrective Action Program and Self-Assessments
  - Effective environment to raise safety issues
  - Effective communication and interfaces between designers, vendors, and construction force; configuration management and oversight



# New Reactor Construction Safety Culture Task Group

- Membership includes
  - Office of New Reactors (NRO)
  - Office of Nuclear Reactor Regulation (NRR)
  - Region II
  - Office of Enforcement (OE)
  - Safety Culture Working Group (SCWG) members  
(developed existing safety culture components and responsible for revisions)
  - NRO contractor with previous nuclear industry construction experience



# Task Group – Current Status

- Preserve existing Safety-Culture Components with some description changes
- Define substantive cross cutting issues as they apply to the Construction Response Table
- Safety Culture Components assessed during Nominal Inspection Process
- Determine appropriate level of follow up inspections where licensee performance has significantly declined



## Next Steps

- Develop Implementation Plan
- Present status updates at future public meetings at May 22<sup>nd</sup> Public Meeting
- Identify additional methods for stakeholder engagement
- Develop Commission Paper



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